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U S EPA REGION I COMMENTS ON DRAFT REMEDIAL INVESTIGATION FEASIBILITY  
STUDY SUPPLEMENTAL WORK PLAN FOR NIKE BATTERY SITE PR-58 NCBC DAVISVILLE

RI

5/7/2013

U S EPA REGION I



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
NEW ENGLAND - REGION I  
5 POST OFFICE SQUARE, SUITE 100 (OSRR 07-03)  
BOSTON, MASSACHUSETTS 02109-3912

May 7, 2013

Casey Haskell  
US Army Corps of Engineers, NE District  
696 Virginia Rd  
Concord, MA 01742

Re: *"Remedial Investigation/Feasibility Study Supplemental Work Plan, Draft, Nike Battery Site PR-58, North Kingston, Rhode Island"*, dated March 29, 2013, North Kingstown Rhode Island

Dear Mr. Haskell:

The Environmental Protection Agency has reviewed the subject document and comments are below.

**GENERAL COMMENTS**

1. A *Draft Remedial Investigation Report for the Former Nike Battery PR-58 Site* was submitted in October 2011 (Draft RI Report). The U.S. EPA provided comments on the October 2011 Draft RI Report in a letter dated December 29, 2011. However, a response to these comments has not been received by the U.S. EPA. EPA's comments identified a number of important concerns regarding the analysis of site data, including the conceptual model developed for the site; the potential feasibility of certain remedial technologies; and the recommendations for the future remedial actions. These concerns remain unaddressed. However, the March 2013 *Draft RI/FS Supplemental Work Plan* (Supplemental Work Plan) (Section 1.4, page 2) indicates that "the development of this work plan relied on the current conceptual site model (CSM) included in the (2011) Draft Remedial Investigation (RI) Report." Presumably, the data gap analysis used to develop investigative activities planned for the Supplemental Investigation is also based on certain assumptions regarding potentially feasible technologies for site remediation (see General Comment No. 2). Consequently, the concerns identified in EPA's December 29, 2011 comments on the October 2011 Draft RI Report should be addressed prior to proceeding with the March 2013 RI/FS Supplemental Work Plan investigation.
2. As indicated in the Introduction (Section 1) and elsewhere throughout the March 2013 Supplemental Work Plan, the activities proposed in the Work Plan are intended to address RI data gaps identified in Stone's *Draft Data Gap Analysis Report*, dated May 25, 2012. However, this Draft Data Gap Analysis Report has not been provided with the March 2013 Supplemental Work Plan. As a result, it is not possible to evaluate the analysis and data underlying the identification of the RI data gaps to determine the adequacy of the identified data gaps. It is noted that the data gaps identified the March 2013 Supplemental Work Plan do not conform in all cases with those originally identified in



the discussion of data limitations provided in Section 6.2.1 to October 2011 Draft RI Report. Please provide a copy of the May 2012 Draft Data Gap Analysis Report so that the assumptions, analysis, and data used to identify the data gaps that are addressed in the March 2013 Supplemental Work Plan can be fully understood and evaluated.

3. The March 2013 Supplemental Work Plan has not addressed key "Recommendations for Future Actions" presented in Section 7 of the October 2011 Draft RI Report. These recommendations included tracer tests in the source area to evaluate the mass flux of groundwater through the Source Area during both background and pumped conditions, to provide data to evaluate the feasibility of treatment and containment remedies; and the groundwater velocity, to evaluate contaminant transport in bedrock. The October 2011 Draft RI Report also recommended annual or bi-annual groundwater sampling for CVOC analysis conducted at selected monitoring wells to provide data for ongoing evaluation of plume migration and/or degradation. Trends in these data also were also to be evaluated to assess the potential presence of newly established DNAPL source areas at the Project that may have resulted from the SER pilot test. If adequate justification for not following these recommendations cannot be provided, the Supplemental Work Plan should be revised to include the recommended activities.
4. The Supplemental Work Plan should be revised to clearly indicate that sufficient data will be obtained to verify that contaminated groundwater exceeding MCLs emanating from the Project area is not or will not in the future migrate from the project area into surrounding areas. IAW the EPA guidance, "**Summary of Key Existing EPA CERCLA Policies for Groundwater Restoration**" June 26, 2009, OSWER Directive 9283.1-33 Available on-line from OSWER [[PDF](#) 11 p. 2.5M] and other guidance located at: <http://www.epa.gov/superfund/health/conmedia/gwdocs/>, remediation to beneficial reuse must be the goal of the Army corps ROD for the Nike-PR-58 FUDS cleanup. EPA does not recognize the RIDEM groundwater classification and instead uses EPA's classification scheme (*EPA Guidelines/or Ground-Water Classification* (Final Draft, December 1986) if a state's classification would lead to a less stringent cleanup.
5. QAPP Worksheets 15-A through 15-Y list Project Action Limits (PAL) and requisite Project Quantitation Limits (PQL) for chemicals included in the laboratory analytical program. In general, the lowest reported PAL should be identified as the PQL. In several instances, the lowest PAL is not identified as the PQL (ex. the lowest PAL for 1,1-Dichloroethane is the EPA Residential RSL at 3.3 mg/kg, but the PQL is listed as RIDEM Residential Direct Exposure Criterion at 920 mg/kg; see Worksheet 15-A). These discrepancies should be highlighted or corrected, as appropriate.
6. In QAPP Worksheets 15-A through 15-Y, chemicals with a PQL below the Laboratory Method Detection Limit (MDL) and Reporting Limit (RL) should be highlighted to better indicate this discrepancy.
7. In QAPP Worksheets 15-A through 15-Y, please indicate why the PQL is blank for a chemical that has a PAL, or revise the worksheets as appropriate.
8. In selected QAPP Worksheets 15-A through 15-Y, the human health risk assessment PAL footnote indicates the EPA RSL for Tapwater from May 2008 was used. Please indicate why the November 2012 version of the EPA RSL table was not used. Changes in RSL values published in May 2008 compared to November 2012 for the chemicals listed should be noted. Otherwise, the PALs should



reference the November 2012 values.

9. In selected QAPP Worksheets 15-A through 15-Y, some tables include ecological risk screening values while others do not. For example, Worksheet 15-C (TCL VOCs in aqueous media; method 8260B) includes EPA Region III Freshwater Screening Benchmarks, while Worksheet 15-K (VOCs in aqueous media; method 524.2) does not. Please provide a rationale or revise tables, as appropriate.
10. EPA has reviewed the RIDEM comments dated April 12, 2013 and agrees with them. Please include us on the distribution list for the Army's responses.

## SPECIFIC COMMENTS

11. p. 6 §2.5: The text indicates that potentiometric maps of groundwater elevations and shallow overburden, deep overburden and bedrock aquifers are shown in figures 6a, 6b, and 6c, respectively. These potentiometric maps were prepared using the most recent round of synoptic hydraulic data collected in 2010. East of the groundwater divide in the Project area, these maps show only a southerly and southeasterly component of groundwater. This is in contrast to Figures 4-3, 4-4, and 4-5 of the October 2011 Draft RI Report, which shows potentiometric maps of groundwater elevations in the shallow overburden deep overburden and bedrock aquifers, respectively, based on October 6, 2009 water-level measurements. The October 2011 Draft RI Report potentiometric surface maps appear to be based on a much larger set of monitoring points and appears to provide much more complete depictions of groundwater flow toward the east and northeast. To ensure that the groundwater flow regime in the site is fully understood and depicted, the Supplementary Investigation Work Plan should be revised to include the potentiometric maps presented in the October 2011 Draft RI Report.
12. p. 7 §2.6: When discussing the definition of the lateral extent of contamination emanating from the Project area, item 5 of the CSM indicates that "...based on the absence of shallow groundwater monitoring wells on the NCBC property within approximately 1,000 feet east of the Property, and on reported historical activities at NCBC sites, uncertainty exists regarding the adequacy of the off-Property shallow groundwater network in this area." While it is correct that shallow groundwater quality in area of the NCBC property immediately east of the PR-58 property boundary is not currently well monitored, this area has been extensively investigated in the past, included extensive soil sampling and sampling of shallow groundwater quality using hydroprobe methods. These investigations identified no significant releases, including groundwater contamination within shallow groundwater, within an area approximately 1,000 feet east of the Property. These investigations have been documented in the *1998 Phase III Comprehensive Remedial Investigation for Study Areas 01 and 04 and IR Program Sites 02 and 03*. Moreover, the results of more recent investigations of shallow groundwater quality in the Site 03 Study Area are documented in the *Final 2009/2010 Field Trip Report for Remedial Investigation* which is included as Attachment 2 to the October 2011 Draft RI Report. This more recent sampling identified no significant contamination in shallow groundwater in the Site 03 Study Area. These past investigation reports should be reviewed, and the uncertainty in shallow groundwater quality within approximately 1,000 feet east of the Property should be reassessed based on the results of these investigations. It would appear that any uncertainty regarding shallow groundwater quality in this area would result from the potential



migration of contaminants from the Project area and would be the responsibility of the USACE.

13. p. 12 §3.1: The lack of primary porosity data from the bedrock has been identified as Data Gap No. 7. The purpose of obtaining these data is to assess the potential for matrix diffusion. The text indicates that “bedrock core logs, outcrops and borehole optical and acoustical televiewer logs show some beds are preferentially solution weathered and contained open holes, veins, and vugs.” The text further states that “these rocks may contain primary porosity on the order of 1% to 10%,” and that “this degree of porosity is sufficient to allow for diffusion of a large amount of contaminant mass from the dissolution of the DNAPL in the fractures into the pore spaces in the matrix.” The text concludes that “it would be very difficult, if not impractical, to remediate this contaminant mass.”

It is not clear that it is appropriate to classify preferentially solution weathered bedrock containing open holes veins and vugs as primary porosity. These features are more frequently considered to contribute to the secondary porosity of bedrock material. However, it is possible that the DNAPL and/or dissolved contaminants may enter and collect in this secondary porosity. Regardless, it cannot be assumed that such porous features could not be accessed and remediated by the remedial technologies available for the remediations of DNAPL and dissolved contaminants in bedrock fractures.

Moreover, as previously indicated in the comments dated December 29, 2011 submitted by EPA on the October 2011 Draft RI Report, diffusion is an extremely slow process and, should the residual contamination in the overburden and fracture network in bedrock be eliminated, the concentrations resulting in bedrock from diffusion of contaminant mass from the rock matrix would likely result in groundwater contaminant concentrations many orders of magnitude less than currently observed in the contaminant source area. Accordingly, the presence of significant primary porosity may not provide an adequate basis for not considering the remediation of DNAPL and dissolved contamination in bedrock.

The definition of primary porosity should be reconsidered, and the value of determining primary porosity of bedrock should be further evaluated to determine if this identified data gap warrants addition laboratory evaluation.

14. p. 20 §5.3: Only minimal information is provided in Section 5.3 of the Supplementary Work Plan regarding the rock core analysis that will be performed to determine primary porosity of bedrock samples. Section 5.3 only indicates that 12 samples taken from previously collected and stored bedrock cores will be analyzed for primary porosity and refers the reader to Section 2.10 of the Sampling and Analysis Plan (SAP) and the Quality Assurance Project Plan (QAPP) for further information. However, the primary description of the rock core analysis is provided in Section 2.4 of the Field Sampling Plan (FSP) of the SAP. The only criteria established in the FSP for selecting the cores to be analyzed is that “the samples will be collected to provide sufficient intact volume to allow the laboratory to extract a 1-inch diameter core approximately 1.75 inches long.” No further information is provided regarding how the existing rock cores will be selected for sampling.

A detailed approach to the selection of the cores for sampling must be provided in the FSP & QAPP to ensure that samples are taken from a representative set of bedrock cores. The cores from which these samples are taken should be representative of the variability in primary porosity that exists in the bedrock in the source area. Ideally, the cores should be taken from locations and depths that are



impacted by DNAPL or the most concentrated portions of the dissolved plume emanating from the source area. The procedures developed to identify the cores from which the samples will be extracted must be sufficient to clearly demonstrate that there is no inherent bias in the selection of cores that will be sampled for the porosity testing.

15. p. 20 §5.4: The monitoring wells that will be sampled as part of the Comprehensive Groundwater Sampling program are shown on Figures 3a and 3b and are summarized in Table 3 of the SAP. One of the purposes of the Comprehensive Groundwater Sampling program is to measure natural attenuation parameters across the Site in an effort to demonstrate that geochemical conditions exist that are conducive to reductive dechlorination to the CVOCs emanating from the source in the Project Area. However, as shown on Figure 3a, key monitoring locations along the known migration pathway toward the east from the source area are not included in the Comprehensive Groundwater Sampling program. These locations include monitoring well clusters MW03-08, MW03-13, and MW-06 and monitoring well MW03-7D. Groundwater quality data from these wells have clearly established that these wells are located along a key migration pathway for contaminants from the source area through the deep overburden and weathered bedrock to the east toward wetlands adjacent to Allen Harbor. These well locations should be included in the Comprehensive Groundwater Sampling program in order to demonstrate that geochemical conditions conducive to the degradation of CVOC are present along this important migration pathway.
16. p. 21 §5.6: Table 1 (page 17) indicates that Data Gap 4, the lack of soil treatment parameters in the source area, will be addressed by soil coring and analysis undertaken as part of the source area sampling. Section 5.6 (Source Area Investigation) indicates that soil treatment parameters will be obtained through FOC and physical analysis of the soil cores collected during the additional source investigation. The Recommendations for Future Actions provided in Section 7.0 of the October 2011 Draft RI Report indicated pyrite and graphite in the bedrock, including the overlying till derived from bedrock, will complicate the implementation of any remedy that changes the geochemistry in the bedrock rock aquifer. As indicated in EPA's December 29, 2011 comments (see General Comment No. 1), any limitations in the selection of remedial technologies due to these minerals will require careful documentation of the presence and location of such minerals as well as documentation of their impact on the efficacy of any specific remedial technology. However, the analysis planned to provide soil treatment parameters in the source area does not appear to capable of addressing the chemical oxygen demand (COD) that these minerals may impose of remediation of the overburden materials, including the till. Moreover this program does not address the impact of pyrite and graphite in the bedrock on potential remediation technologies applicable to contamination in bedrock. Unless the presence of pyrite and graphite are no longer thought to potentially impact the selection of remedial technologies at the site, consideration should be given to evaluating the impact of these minerals on the feasibility of potential remediation technologies.
17. QAPP 15-A: The worksheet does not list ecological screening levels for soil.
18. QAPP 15-B The worksheet appears to show incorrect MCLs for Nitrate and Nitrite. The MCL for Nitrate is 10,000 µg/l, not 10 µg/l. The MCL for Nitrite is MCL is 1000 µg/l, not 1µg/l.
19. QAPP 15-I The footnote should indicate that these methods are intended to provide data to assess biological activity related to bioremediation.

20. QAPP 15-O      The footnote should define "FOC" as fractional organic carbon. Additionally, this term should be added to the list of acronyms.
21. QAPP 15-P      The table does not list a RIDEM PAL for TPH in soil. However, the RIDEM Residential Direct Exposure Criteria and GA Leachability Criteria for TPH are 500 ppm, and the Industrial/Commercial Direct Exposure Criteria and GB Leachability Criteria are 2,500 ppm. Please explain why the RIDEM criteria are not listed as the PAL, or revise the table as appropriate.
22. QAPP 15-R through footnotes      To avoid confusion regarding the absence of PALS for NAPL/IDW, QAPP 15-Y should explain that PALs are not applicable to free product (NAPL) or Investigation Derived Waste.

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If you have any questions with regard to this letter, please contact me at (617) 918-1384.

Sincerely,



Christine A.P. Williams, RPM  
Federal Facilities Superfund Section

cc: Richard Gottlieb, RIDEM (via e-mail only)  
Dave Barney, Navy BEC (via e-mail only)  
Jeff Dale, Navy RPM (via e-mail only)  
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